(3) Remarks

Reconsideration and allowance of claims 1-20, all of the claims pending in this application, are respectfully requested in view of the following remarks.

Claims 1, 5 and 16 to 20 have been amended. The amendments to claims 1 and 16 are substantive and are believed to better distinguish the claims from the prior art. The amendments to claims 5 and 17 to 20 are editorial, omitting redundant expressions.

At the outset, applicants wish to thank examiners Chawla and Hendricks for their courtesy during an interview at the patent office on October 11, 2006. While no agreement was specifically reached, the claims as submitted reflect the nature of changes discussed by the undersigned as being helpful in overcoming the rejections to the claims.

Applicants have provided a copy of a chapter of a text with information pertinent to the present invention on the subject of gelatin analysis for physicochemical properties. (Water Science Reviews 3; Chapter 2, Harry Levine and Louise Slade, 1988, pp.79-175) (Hereinafter, this reference is referred to as the "Levine" reference.) It should be noted that two of the authors are coinventors of the present invention. This reference does not relate to confections, but provides insight into the tests that applicants present in Example 7 of the application which compares the *trans*-to-*cis* conversion resulting from the process of the invention from what occurred from a sample prepared according to the prior art in Example 4.

It will be recalled that the present application specifically relates to improvements and processing for the preparation of aerated confections, such as various marshmallow products. In paragraph [0030], applicants have stated, in part:

> Reference is made to FIG. 1, which shows a typical prior-art process for preparing marshmallow products. It can be seen that it calls for dissolving gelatin in water at a temperature of from about 65 to 80°C., e.g., from about 65° to 7°C being typical. Comparison of gelatin processed in this manner to gelatin processed according to the invention has shown that the prior-art procedure caused isomerization of the gelatin to its *cis* form, to an extent that

> diminished the desirable properties of the gelatin, such as extensibility and elastic recovery. In addition, the marshmallows prepared according to the prior-art process tended to exhibit surface graining to a greater extent than for those prepared according to the present invention. The extent of isomerization to the cis form can be observed analytically by modulated differential scanning calorimetry (MDSC), by measuring the enthalpy of the peak corresponding to the point defined as T1, the temperature of isomerization for gelatin in marshmallow products. In MDSC, the material being analyzed is heated at a steady rate, with a programmed saw-tooth pattern of heating and cooling superimposed upon the steady rate. The fluctuation in temperature of the saw-tooth pattern is about plus or minus 0.5°C. The MDSC technique allows a more precise analysis of the isomerization temperature, because it separates overlapping thermal events such as irreversible decomposition. The MDSC instrument and method used to characterize the gelatin in marshmallow are described below in Example 7.

The Levine reference discusses gelatin technology to point out the significance of the isomerization, but does not relate to marshmallow type confections or provide any guidance to one seeking to improve them.

The prior art is not concerned with the problems addressed by applicants. The present invention provides a dry mix and a multi-step process utilizing it. The mix and process minimize Bloom loss due to isomerization of the gelatin backbone, and allow high production yields of improved aerated confections, even though abusive temperatures are incurred in the subsequent confectionery manufacturing process.

The description in the present application also notes, in paragraph [0033] that:

> By utilizing the process of the invention, one can achieve the aforementioned advantages, importantly including the product improvements and the ability to hold the gelatin solution for longer periods of time. The use of the combined ingredient makes batching easier and eliminates at least one potential source of error on the plant floor.

The gelatin section header of the Levine reference is marked on page 162, and the section about the discovery and interpretation of the isomerization transition in the DSC profiles is marked on pages 166-167. The *most important* section about the phenomenon of Bloom loss", and its explanation as the *trans*-to-*cis* isomerization that occurs as a result of abusive temperatures during processing, is highlighted by a double square on page 171.

Importantly, the chapter *does not* provide any means to avoid this Bloom Loss and consequent loss of functionality except by:

1) avoid abusive temperatures in the process (thereby slowing down the process and decreasing yields unacceptably for an economical process)

2) provide a very long time after heating at a temperature below Ti and just above Tm, in order to allow very, very slow reversion of the cis isomer to the more stable trans isomer of the gelatin backbone.

The reversion of *cis* back to *trans* is never 100% complete, and the extra time and holding tanks are cost prohibitive in practice, although this reversion process was used commercially for refrigerated gelatin desserts, that required avoidance of maturation and toughening during shelf life. The process of the invention avoids the conversion and its detrimental effects in a way not predictable from this or other reference.

Also, the chapter *does not* discuss applications of the isomerization discovery to aerated confections.

The dry mix, when used in the multi-step process of the present invention helps minimize Bloom loss due to isomerization of the gelatin backbone and allows high production yields of improved aerated confections, even though abusive temperatures are incurred in the subsequent confectionery manufacturing process.

Claims 16-20 have been rejected under 35 USC §102 as being anticipated by Pintauro, *et al*. (United States Patent No. 3,067,036). This rejection is respectfully traversed.

These claims have been closed to exclude the added components that Pintauro, *et al*., mix together for their objectives, which are different than those of the invention.

Pintauro's intention, in selecting < 40 mesh particle size for sugar and gelatin solids in a dry blend with adipic acid for a gelatin dessert mix, is to make a dry blend free from stratification (column 7, 63-70) , whereas the purpose of the present invention is to facilitate hydration of gelatin. They achieve this by using a nonuniform particle size for the adipic acid, while using a uniform particle size for the gelatin and sugar. Thus, it does not teach uniformity as a general rule and does not relate to the problems addressed by the invention. Primarily, the reference is concerned with dry blending adipic acid and gelatin without stratification – not forming dry blends of sugar and gelatin which will hydrate better in the formation of confections having better properties. Hydration is not mentioned in Pintauro because the dry sugar-gelatin blend product is sold as a powder which is later hydrated by the consumer in the conventional way with hot (> 140 °F) water in excess amounts. Again, here, the invention deals with confections which utilize relatively low moisture contents, but yet require complete and rapid hydration.

The affected claims have been amended also to state the effect which the dry mix can impart to a particular type of process. Accordingly, there can be no anticipation of these claims by the description of Pintauro, *et al*., and the improvements that the invention provides in the different context fairly establish nonobviousness.

Claims 1, and 5-15 have been rejected under 35 USC §103 as defining an invention which is obvious from Zietlow, *et al*. (United States Patent No. 6,432,460) in view of Addesso (United States Patent No. 3,362,830). This rejection is respectfully traversed.

Applicants again point to their description and the examples, which show improvements over the prior art, particularly comparing their process to the prior art which formed separate solutions of gelatin and sucrose for blending in marshmallow manufacture.

Zietlow, *et al*., teaches hydration of gelatin separately from sugar (Figure 1, step 27). This reference is discussed on page 3, of the present application (¶ [0008]). There, applicants state that a sugar syrup is prepared separately from a gelatin solution, and the combined blend is then further processed. This is different from the invention where the gelatin and sugar are mixed dry to form a blend, which is then hydrated. The dry mixture of the invention is important to the quality of the final product. The significance can be seen by comparing the results of Examples 4 and 7.

The Addesso reference does not cure the deficiencies of Zietlow, *et al*., Addesso, in the processing of cold water soluble gelatin, dry blends sugar and gelatin prior to hydration but points out that certain steps are critical to obtaining cold water soluble gelatin. He discusses hydrating with equal amounts of water (50% solids concentration) Column 2, 6-11 Compared with paragraph 0034 which describes the use of much less water (2.5 part to 1 part water) to accomplish the hydration.

Addesso discloses heated water to dissolve the solids (Column 2, 4-8). The point of the present invention is that a two step hydration process is important to improved results, with cool water at about 20 °C to 35 °C used to hydrate the gelatin before sucrose becomes so fully dissolved such that it inhibits the gelatin hydration (paragraph 0035). The second step of the two step sugar-gelatin hydration is heating to a temperature sufficient to dissolve all the solids (preferred 65 °C to 75 °C; about 165 °F) and with hold times of up to 4 hours or more. In contrast, Addesso discusses the criticality of cold water soluble gelatin casting temperature of < 140 °F and rapid drying (column 3, 26-31) in order to maintain function.

Furthermore, the technology of the present invention discloses the unexpected result of preserving the trans (gel-forming) configuration of gelatin and inhibiting bloom loss by the isomerization to *cis* form (non-gelling).

Claims 3 and 4 have been rejected under 35 USC §103 as defining an invention which is obvious from Zietlow, *et al*. (United States Patent No. 6,432,460) and Addesso (United

States Patent No. 3,362,830) in further view of Gajewski (United States Patent No. 4,251,561). This rejection is respectfully traversed.

The Gajewski reference does not cure the deficiencies of the other references. Gajewski discloses a two step gelatin hydration process without sucrose. Gajewski discusses the need to hydrate gelatin prior to the addition of sugars (Column 8, 15-16). He also points out the criticality of sufficient water, indicating solids not to exceed the amount of 1 part gelatin to 2.5 parts water (Column 8, 20-27). He discusses pronounced gelatin degradation at hold times around 150 minutes (Column 8, 33-35). Gajewski clearly does not achieve the unique and unexpected results produced by the invention.

For all of the rejections under 35 USC §103, there is a lack of motivation provided to the skilled worker as to why he should take teachings from one reference and use them to modify another presumptively effective process. Certainly, there is no teaching or suggestion that if one were to make the proposed combinations, the unexpectedly improved results of the invention could be achieved. The process is by all means novel and results in untaught and unsuggested results. Therefore, it is believed that the claims as now amended meet the test for unobviousness as set out in the statute.

Applicants have made a significant contribution to the art of aerated confections, providing simplicity, economy and superior results. The claims set forth the invention clearly and concisely in terms which distinguish from the prior art. Accordingly, allowance of all claims is believed in order and such action is earnestly solicited.

Respectfully submitted,

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